SMC DPM NPRM
Comments 10.08.03.

-----Original Message-----
From: mcrum@stillwatermining.com [mailto:mcrum@stillwatermining.com]
Sent: Wednesday, October 08, 2003 6:04 PM
To: comments@msha.gov
Cc: swood@stillwatermining.com; randerson@stillwatermining.com;
jphipps@stillwatermining.com; mmcgivern@stillwatermining.com
Subject: Comments on DPM Rule Federal Register Volume 68, Number 157

(See attached file: SMC DPM NPRM Comments 10.08.03.pdf)

COMMENTS OF STILLWATER MINING COMPANY
IN RESPONSE TO THE MINE SAFETY AND HEALTH ADMINISTRATION
PROPOSED RULEMAKING ON DIESEL PARTICULATE MATTER EXPOSURE OF
UNDERGROUND METAL AND NONMETAL MINERS
FEDERAL REGISTER VOLUME 68, NUMBER 157 (AUGUST 14, 2003)

The Stillwater Mine, MSHA ID# 24-01490, and the East Boulder Mine, MSHA ID# 24-01879, collectively submit the following comments in response to the Mine Safety and Health Administration's ("MSHA") Notice of Proposed Rulemaking dated August 14, 2003 (68 Federal Register 157). Stillwater Mining Company appreciates MSHA's solicitation of comments on the anticipated rulemaking, and welcomes the opportunity to share thoughts and comments as the agency formulates its proposed rule for notice and comment. Stillwater is a member of NMA, NvMA, the MARG Diesel Coalition and the NIOSH diesel partnership. We endorse the comments of NMA, NvMA and MARG.

As MSHA is aware, Stillwater Mining Company has been a leader in the cooperative, good faith effort between labor, industry and the Agency. Stillwater also welcomes further opportunities to join in such a partnership to advance or clarify the impending rule.

DPM Control Systems: 10-Year Mine Plan Feasibility

Stillwater Mining Company has been an industry leader in Diesel Particulate Matter control technology, proactive in the research process with the Diesel Partnership to prove the feasibility of known particulate control technologies with our involvement and commitment to the NIOSH studies unmatched in the mining community. Although each party has viewed the progress with a different end purpose in mind, we have all worked together to determine the feasibility of a DPM standard for the underground mining industry. Stillwater Mining Company has proactively committed resources in an effort to reach compliance with the Interim Final Concentration Limit of 400µg/m3 Total Carbon. To date the Stillwater Mine has been unsuccessful at reaching even close to 100% compliance with the Interim Limit. Another aspect of the filter technology that has not been adequately researched is the formation of significant amounts of nanoparticulate matter. If significant amounts of nanoparticles are produced as a result of the filtration devices, then the regulation is creating a significantly higher risk to miners due to the particles capability of being inhaled into the deep lung regions.

As will be explained in detail below, utilizing the active filtration system is absolutely cost prohibitive. The feasibility documentation was compiled to illustrate the economic impact of this system. This is by no means a forward looking statement on the viability of the operation, but is an educated extrapolation of the anticipated costs required to bring the mine to what MSHA deems cutting edge technology in DPM control.

Passive Soot Trap Technology

Significant issues have arisen during our trials of the passive filter systems; most noticeably the substantial increase in NO_2 emissions. The light platinum wash-coat

systems, currently in use, have created significant down time costs due to the increased NO_2 emission. This cost is due to the MSHA Ceiling Limit of 5ppm NO_2 where, once a miner reaches 5ppm they can have no further NO_2 exposures for the duration of their shift. This has created situations where entire levels of the mine were evacuated (conservatively) due to the NO_2 concentrations in the ventilation circuit. This condition became very apparent during the NIOSH Case Study where we had two new soot filters in use. The equipment operators noted an increase of NO_2 (using TMX-412 gas monitors) during each day of the test. The most notable excursion of NO_2 observed by the study team during the case study was in the 35W FWL when an Elphinstone R-1300 mucker was loading an MTI 1604 Haul Truck. The NO_2 concentration reached 3.8ppm 30 feet downstream of the load point in an air volume of >80,000 cfm. This type of gaseous emission would significantly impact production in areas where auxiliary ventilation rates are <30,000 cfm. In any situation imaginable, the passive filters would reach the end of their service life and need to be replaced with new high NO_2 emitting units; inserting a known contaminant emitter into the miner's working environment.

Active Soot Trap Technology

Considering the alternative active filtration system where the trap is regenerated by external means through a regeneration station, feasibility and mine viability come into question. Based on a 10-year mine plan for the Stillwater Mine, the net cash cost per ounce increases by $33/oz averaged over 10 years without a true guarantee of compliance. Ultimately, this additional cost drives our cash cost higher than our market cost per ounce making it infeasible for Stillwater Mine to operate.

Regeneration Stations

Mine development averages approximately 2000 feet per mining level per year as we follow the ore body. To effectively manage the required filter regeneration, parking areas will need to be installed on each level of the mine in each active easting or westing. As the mine plan appears today, 24 parking areas would be required throughout the mine for our heavy emitters (176 pieces of equipment). These parking areas would be long enough to hold 10 units, a filtration system (wet scrubber) and ventilation fan, wide enough to allow egress for our largest piece of equipment. Each station will also need a dedicated power source and air supply. Given our development cost of $900 per equivalent foot, these dedicated regeneration stations will cost approximately $29 Million every other year as long as the time required to move the equipment to the station does not greatly impact production. At the average speed of a mining LHD of 2 MPH, it is not unreasonable to expect travel time to impact production by 2 hours per day during the latter period of the station building cycle.

Active Filtration Systems

It is unknown what can be expected for a usable life of an active filter as only one has been studied at the Stillwater facility, but there can be certainty that there will be premature failures due to rough handling or run away regeneration. This can only be factored into the cost per ounce equation by using a contingency number. Also, the filters decrease in efficiency each time they are regenerated but this number is difficult to quantify so only an estimate is possible until historical data can be compiled.

Manufacturer estimates of filter life have been suggested to be 5000 hours plus and while there will be instances of long life, a more reasonable life would be substantially less, perhaps to the order 2500 to 3000 hours. This has been quantified with Stillwater's >28,000 hours of experience with the passive trap and there is more reason to expect the life to be less, not more, due to the additional complexities of the active unit.

Summation

Stillwater Mining Company is committed to providing a safe and healthful work environment for employees and visitors to our operations. Our commitment to the diesel partnership activities has been unsurpassed by any other US mining company, although this commitment has come at a cost. Incurred costs associated with our involvement in numerous research projects, including the NIOSH studies, were never questioned even when substantial impairments to production occurred. It is Stillwater Mining Company's philosophy that we will do everything feasible to both comply with regulatory requirements and provide a desirable work environment. As can be observed from the attached documentation, Stillwater Mining Company has spent considerable resources in our attempt to comply with the 400µg/m^3 Interim Concentration Limit with minimal success. The technology and cost to achieve the proposed 160µg/m^3 Final Concentration Limit is unattainable in today's market. The transitional price tag for Stillwater Mining Company to install and manage Active Regeneration Filters would be economically devastating. Neither the capital dollars nor the guarantee of compliance to the 160µg/m^3 Final Limit exist to make spending this money an intelligent business decision. Although technology hasn't proven to be the sole answer from either a compliance or a feasibility standpoint, Stillwater Mining Company will continue to research new technology and work within the Diesel Partnership in search of control technologies.

Stillwater Mining Emissions Cost Rollout

Proj ID #	DISCRIPTION	COST		DETAIL
1	Filter Costs to Date	**$160,000.00**		Engelhard and DCL installed, replacement and spares
2	NIOSH Man hours- Maintenance	**$6,500.00**		Tech costs for isozone and case study equipment prep.
3	NIOSH Man Hours- IH	**$10,926.50**		
4	NIOSH Man Hours- Ops	**$3,800.00**		
5	NIOSH Man Hours- Emissions	**$6,500.00**		Includes installation labor, hardware, filter housing
6	Ventilation Upgrade Costs	**$5,860,356.00**		$24.42 per added cfm @240,000cfm
7	Sean MeGinn Costs	**$10,500.00**		Emissions Tuning Seminar / includes 2 additional weeks for fall 2003
8	Deutz Training/Consult	**$4,500.00**		includes 1person 4 day session at SLC + 4 personnel 2 day session at SLC
9	T&E Costs	**$1,200.00**		2 personnel 3 days dyno testing
10	Emission Testing Equipment Costs	**$78,000.00**		Includes 4 hand held gaseous emissions testers, 1 shop tester, emissions calibration equipment, 10 Magnihelics, 4 Smoke Check 1667 (opacity meters), 4 data loggers, 1 digital tach, 2 armored computers, 1 kiln, 1- trap cleaning station (Combi Clean), 2 temp guns, specialty tuning tools
11	MSHA Studies Costs	**$5,874.65**		
12	UofU/Montana tech Study costs- IH Only	**$2,856.96**		
13	Travel Costs for DPM Workshops etc.	**$3,600.00**		MDEC conference, SLC conferences
14	MARG Costs	**$139,397.13**		
15	Maintenance Emissions related Manhours Costs	**$165,000.00**		Associated emissions costs to date
16	Emissions Technicians Manhours	**$105,400.00**		14 months x $30/hour burdened cost + 8 months x $30/hour burdened cost
17	NO2 Evacuation Costs	**$927,570.00**		919 manhours @$30/hour plus $900,000 production loss
18	subtotal costs to date	**$7,491,981.24**		
19	Active Filter System Costs	$3,193,872.00		min. 175 active filters @ $8,300 per unit, +88spare traps @$6000ea every other year (3 sets in 3 years), + $5,400 per cleaning station - 1 station per 2 traps. **PROJECTED COST**
20	Excavation Costs (includes Electrical and Air installation costs)	$100,272,806.00		Cost based on 10 year mine plan. 5-year mine plan cost for 24 runarounds advanced with mine development is $61,087,041
21	Active Filter Change out Cost	**$2,640.00**		88 filters @1Hr. Mechanical labor @$30 burden rate
22	Active System Total Projected Cost	**$103,469,318.00**		
23	Long Range additional cost per ounce(10 year plan cost)	**$33.27**		Average additional cash cost per ounce based on 10yr forecast
24	Emissions Room	$170,000.00		**Budgeted cost for AFE**/ to be constructed fall 2003
25	**Total and projected costs based on 10yr plan**	**$111,131,299.24**		**= sum lines 18, 22, 24**
26	**East Boulder Items**			
27	Filter Costs to Date	**$126,235.92**		
28	Electronic Engine Controls	**$66,230.00**		Cost through September 2003
29	NIOSH Man hours- To Date			
30	Maintenance Man Hours- Emissions Related	**$45,360.00**		Average 84 hours per week @$30 burden rate beginning Sept. 2003 through December 2003
31	Maintenance Training Costs	**$1,800.00**		
32	Travel Costs for DPM Workshop	**$3,000.00**		
33	Emissions Testing Equipment Costs	**$22,200.00**		
34	subtotal costs to date	**$264,825.92**		
35	Ventilation Upgrade Projected Costs	$5,400,000.00		2000 ft vent raise to surface. Interim proposed controlled recirculation ventilation @ $400,000
36	Active Filter System Costs	$431,700.00		min. 21 active filters @$8,300 per unit, +11 spare filters @$6000ea every other year(3 sets in 3 years), +$5400 per regen station x11. PROJECTED COST
37	Excavation Costs (includes Electrical and Air installation costs)	$472,500.00		Based on initial installation only. This figure includes electrical and air installation.
38	Active Filter Changeout Costs	$330.00		11 filters @1 Hr. Mechanical labor @ $30 burden rate.
39	Active System Total Projected Cost	**$6,304,530.00**		
40	**Total and projected costs based on 10yr plan**	**$6,569,355.92**		**= sum lines 34 and 39**
41				
42	**Company Total and Projected Expenditures**	**$117,700,655.16**		

Emissions expenditure is averaging $43,000 per month since inception with current technologies and trials. Not included in spread sheet is replacement engines and electronic governors covered under the Emissions AFE of $1.9M for 3 years. See attached spread sheet for actual costs per month.

Stillwater Mine 10 year Projected Costs For Active Filtration Systems

Additional cash cost per recoverable ounce													
Year	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**			
Filter Installation cost	$1,558,100.00												
Excavation Cost	$29,744,447.00		$29,744,447.00		$29,744,447.00		$29,744,447.00		$29,744,447.00				
Spare traps		$528,000.00	$528,000.00		$528,000.00		$528,000.00		$528,000.00				
Regeneration Stations	$475,200.00												
Emissions Tech.	$124,800.00	$124,800.00	$124,800.00	$124,800.00	$124,800.00	$124,800.00	$124,800.00	$124,800.00	$124,800.00	$124,800.00			
Industrial Hygienists	$31,200.00	$31,200.00	$31,200.00	$31,200.00	$31,200.00	$31,200.00	$31,200.00	$31,200.00	$31,200.00	$31,200.00			
Maintenance Costs	$165,000.00	$165,000.00	$165,000.00	$165,000.00	$165,000.00	$165,000.00	$165,000.00	$165,000.00	$165,000.00	$165,000.00			
Total Cost	$32,098,747.00	$849,000.00	$30,593,447.00	$321,000.00	$30,593,447.00	$321,000.00	$30,593,447.00	$321,000.00	$30,593,447.00	$321,000.00	$156,605,535.00		
Filter system Cost per returnable ounce	$73.34	$1.90	$64.32	$0.66	$61.40	$0.65	$64.03	$0.68	$65.05	$0.69	$33.27		
Returnable Ounces	437666	445807	475634	484865	498258	490510	477783	471115	470273	467875	4719786	471,979	$15,704,522.53
Total Cash Funding per ounce	$417.00	$376.00	$371.00	$350.00	$356.00	$361.00	$341.00	$349.00	$343.00	$343.00	$360.70		
Cash Cost per ounce including filtration costs	$490.34	$377.90	$435.32	$350.66	$417.40	$361.65	$405.03	$349.68	$408.05	$343.69	$393.97		
Average Annual Cost Per Returnable Ounce					$33.27								
Average Returnable Ounces					471,979								
Average Annual Cost					$15,704,522.53								

East Boulder 10 Year Projected Cost For Active Filtration Systems

Additional cash cost per recoverable ounce for ventilation upgrade and active filtration systems													
Year	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	10yr outlook		
Ventilaion Upgrade Costs	$5,400,000.00												
Filter Installation cost	$191,230.00												
Excavation Cost	$472,500.00		$472,500.00		$472,500.00		$472,500.00		$472,500.00				
Spare traps		$66,000.00	$66,000.00		$66,000.00		$66,000.00		$66,000.00				
Regeneration Stations	$59,400.00												
Emissions Tech.	$124,800.00	$124,800.00	$124,800.00	$124,800.00	$124,800.00	$124,800.00	$124,800.00	$124,800.00	$124,800.00	$124,800.00			
Industrial Hygienist Cost	$31,200.00	$31,200.00	$31,200.00	$31,200.00	$31,200.00	$31,200.00	$31,200.00	$31,200.00	$31,200.00	$31,200.00			
Maintenance Costs	$24,960.00	$24,960.00	$24,960.00	$24,960.00	$24,960.00	$24,960.00	$24,960.00	$24,960.00	$24,960.00	$24,960.00			
Total Cost	$6,304,090.00	$246,960.00	$719,460.00	$180,960.00	$719,460.00	$180,960.00	$719,460.00	$180,960.00	$719,460.00	$180,960.00	$10,152,730.00		
Filter system Cost per returnable ounce	$31.06	$1.10	$3.17	$0.79	$3.14	$0.79	$3.14	$0.79	$3.14	$0.79	$4.79		
Returnable Ounces	202,989	223,943	227,168	229,304	229,304	229,304	229,304	229,304	229,304	229,304	2259225	225,923	$1,082,070.07
Total Cash Funding per ounce	**$ 416.61**	**$ 375.55**	**$ 370.92**	**$ 349.99**	**$ 356.12**	**$ 361.46**	**$ 341.33**	**$ 349.19**	**$ 343.19**	**$ 343.03**	**$ 366.23**		
Cash Cost per ounce including filtration costs	$447.66	$376.65	$374.08	$350.78	$359.26	$362.25	$344.47	$349.98	$346.33	$343.82	$371.02		
Average Annual Cost Per Returnable Ounce			$4.79										
Average Returnable Ounces			225,923										
Average Additional Annual Cost			$1,082,070.07										
Cost indicates 21 heavy DPM emitters and excavation costs													

Runaround Parking for 10 Pieces of Equipment					
	Item	**Unit**	**Units**	**Unit Cost**	**Total**
Excavation	Excavation	Eq. Ft	592.3	$1,138.51	$674,380
	Additional Ground Support	Eq. Ft	555.5	$150.00	$83,332
Concrete	Concrete	YD^3	124.5	$141.00	$17,552
	Reinforcing Steel	Ft	9410.9	$0.40	$3,764
	Labor-Form		152.8	$37.00	$5,653
	Labor-Rebar		169.4	$37.00	$6,268
	Labor-Pour		158.1	$37.00	$5,849
	Labor-Fine Grade		183.3	$37.00	$6,783
	Misc				$4,000
Shotcrete	Shotcrete	YD^3	279.9	$232.28	$65,015
	Labor-Shotcrete	YD^3	279.9	$645.00	$180,536
Misc.	Fan/Silencer		1.0	$8,800.00	$8,800
	Bulkhead		1.0	$12,000.00	$12,000
	Scrubber		1.0	$80,000.00	$80,000
	Labor-Fan/Scrubber		240.0	$44.00	$10,560
Ducting	Vent Hoods		10.0	$500.00	$5,000
Electrical	Equipment				$75,000
	Excavation	Eq. Ft	27.3	$1,138.51	$31,050
	Concrete		6.1	$141.00	$862
	Reinforcing Steel		462.0	$0.40	$185
	Labor-Form		7.5	$37.00	$278
	Labor-Rebar		8.3	$37.00	$308
	Labor-Pour		7.8	$37.00	$287
	Labor-Fine Grade		9.0	$37.00	$333
Fire Suppression	Fire Suppression				$25,000
Contingency	Contingency @ 15%				$174,674
	Total				**$1,477,468**

Runaround Parking for 5 Pieces of Equipment					
	Item	**Unit**	**Units**	**Unit Cost**	**Total**
Excavation	Excavation	Eq. Ft	320.4	$1,138.51	$364,807
	Additional Ground Support	Eq. Ft	283.6	$150.00	$42,545
Concrete	Concrete	YD^3	63.6	$141.00	$8,961
	Reinforcing Steel	Ft	4804.8	$0.40	$1,922
	Labor-Form		78.0	$37.00	$2,886
	Labor-Rebar		86.5	$37.00	$3,200
	Labor-Pour		80.7	$37.00	$2,986
	Labor-Fine Grade		93.6	$37.00	$3,463
	Misc				$4,000
Shotcrete	Shotcrete	YD^3	148.3	$232.28	$34,452
	Labor-Shotcrete	YD^3	148.3	$645.00	$95,666
Misc.	Fan/Silencer		1.0	$8,800.00	$8,800
	Bulkhead		1.0	$12,000.00	$12,000
	Scrubber		1.0	$80,000.00	$80,000
	Labor-Fan/Scrubber		240.0	$44.00	$10,560
Ducting	Vent Hoods		10.0	$500.00	$5,000
Electrical	Equipment				$75,000
	Excavation	Eq. Ft	27.3	$1,138.51	$31,050
	Concrete		6.1	$141.00	$862
	Reinforcing Steel		462.0	$0.40	$185
	Labor-Form		7.5	$37.00	$278
	Labor-Rebar		8.3	$37.00	$308
	Labor-Pour		7.8	$37.00	$287
	Labor-Fine Grade		9.0	$37.00	$333
Fire Suppression	Fire Suppression				$15,000
Contingency	Contingency @ 15%				$101,438
	Total				**$905,990**

Location	Bays Required	Cost
69w FWL	1	$905,990
66w FWL	2	$1,477,468
63w FWL	2	$1,477,468
61w FWL	2	$1,477,468
56w FWL	2	$1,477,468
53w FWL	2	$1,477,468
50w FWL	2	$1,477,468
47w FWL	1	$905,990
44 Shaft	2	$1,477,468
44w FWL	1	$905,990
44e FWL	1	$905,990
41w FWL	2	$1,477,468
41e FWL	1	$905,990
38 Shaft	2	$1,477,468
38w FWL	2	$1,477,468
38e FWL	1	$905,990
35 Shaft	2	$1,477,468
35w FWL	1	$905,990
35e FWL	1	$905,990
32 Shaft	2	$1,477,468
32w FWL	2	$1,477,468
32e FWL	1	$905,990
29w FWL	2	$1,477,468
29e FWL	1	$905,990
Total		**$29,744,447**

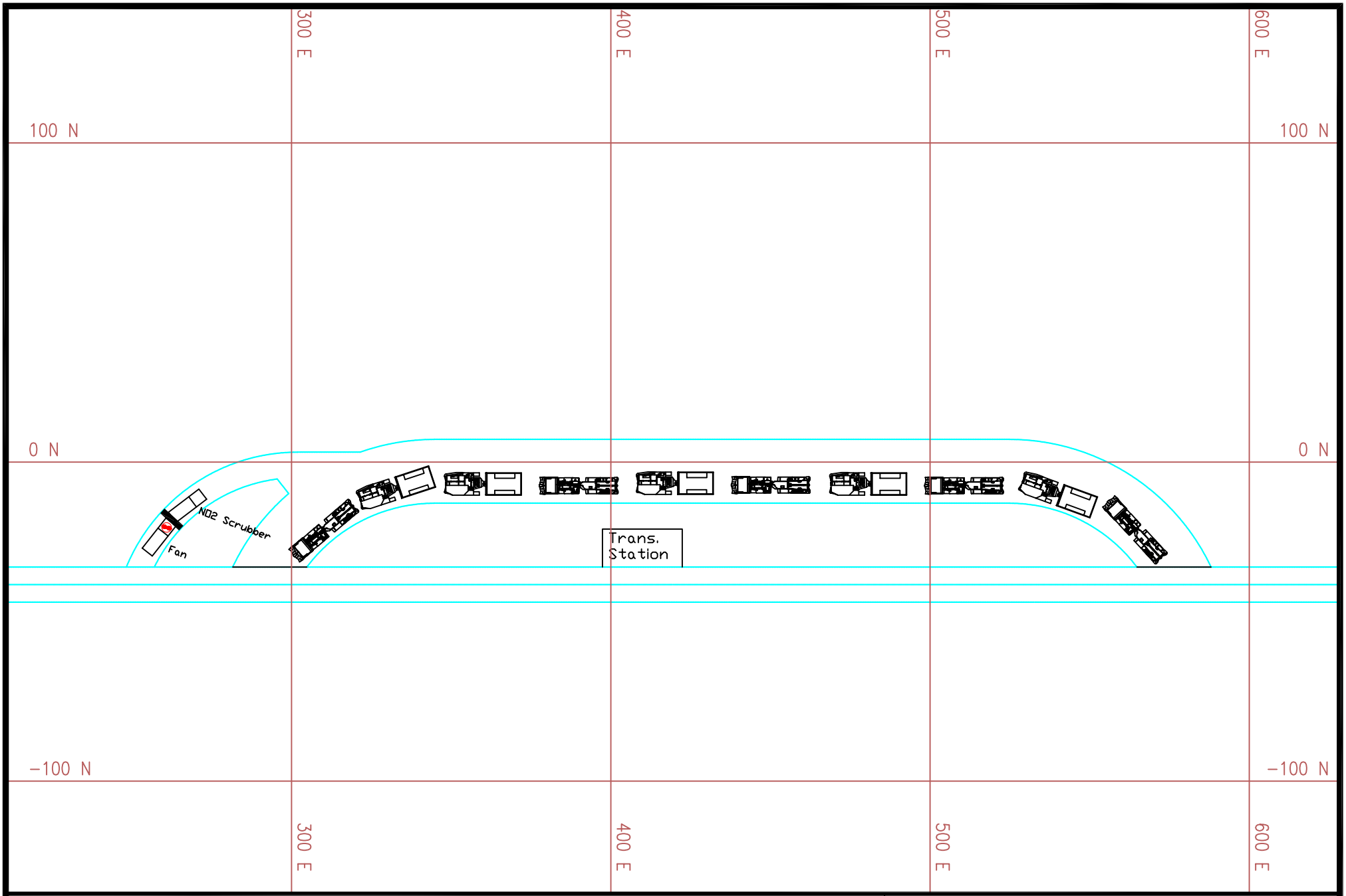
Ver091103 Plan	2,004	2,005	2,006	2,007	2,008	2,009	2,010	2,011	2,012	2,013	Average 2004-2013
Total Ore (Tons)	721,450	748,250	775,700	798,550	823,500	821,250	821,250	821,250	823,500	821,259	**797,596**
Total Stope Ounces (Mill Feed Basis)	468,483	477,660	510,286	520,267	535,126	526,610	513,698	506,428	505,065	502,602	**506,622**
TOTAL TONS BROKEN	1,682,087	1,811,821	1,876,145	1,887,485	1,905,069	1,892,404	1,890,065	1,861,867	1,832,795	1,825,096	**1,846,483**
FWL Advance ft	13,887	17,087	19,110	16,235	19,213	19,160	20,494	20,909	18,792	13,997	**17,888**
Number of runarounds needed [1]	2.8	3.4	3.8	3.2	3.8	3.8	4.1	4.2	3.8	2.8	**3.6**
Cumulative runarounds	2.8	6.2	10.0	13.3	17.1	20.9	25.0	29.2	33.0	35.8	
Total Cost/Year-Capital [3]	$4,185,472	$5,253,083	$5,992,501	$5,192,652	$6,268,142	$6,375,966	$6,956,290	$7,238,999	$6,636,248	$5,041,717	**$5,914,107**
Total Cost/Year-Operating [2]	$703,708	$793,517	$893,959	$979,288	$1,080,270	$1,180,976	$1,288,693	$1,398,589	$1,497,360	$1,570,927	
Total Cost/Year	$4,889,180	$6,046,601	$6,886,461	$6,171,940	$7,348,412	$7,556,942	$8,244,982	$8,637,588	$8,133,608	$6,612,645	
Cumlative Cost [3]	$4,889,180	$10,935,781	$17,822,242	$23,994,182	$31,342,594	$38,899,536	$47,144,519	$55,782,107	$63,915,714	$70,528,359	
Initial Capital + Cumulative [4]	$34,633,627	$40,680,228	$47,566,689	$53,738,629	$61,087,041	$68,643,983	$76,888,966	$85,526,554	$93,660,161	**$100,272,806**	
Cost/Ore Ton	$6.78	$8.08	$8.88	$7.73	$8.92	$9.20	$10.04	$10.52	$9.88	$8.05	**$8.81**
Cost/Total Ton	$2.91	$3.34	$3.67	$3.27	$3.86	$3.99	$4.36	$4.64	$4.44	$3.62	**$3.81**
Cost/Ounce	$10.44	$12.66	$13.50	$11.86	$13.73	$14.35	$16.05	$17.06	$16.10	$13.16	**$13.89**
5 year average Cost/Ore Ton					$8.08	$8.56	$8.95	$9.28	$9.71	$9.54	**$9.02**
5 year average Cost/Total Ton					$3.41	$3.63	$3.83	$4.02	$4.26	$4.21	**$3.89**
5 year average Cost/Ounce					$12.44	$13.22	$13.90	$14.61	$15.46	$15.34	**$14.16**

[1] 1 runaround needed/5,000 ft of development

[2] Active regeneration systems run 8 hours/day. Electrical costs average 4.5c/kwh

[3] Cumulative costs include 2% inflation

[4] Initial Capital is for 24 runarounds $29,744,447



STILLWATER MINING COMPANY
HC – 54 Box 365
Nye, MT 59061

TITLE: FILTER REGEN RUNAROUND

DRAWN BY: JDT	SCALE: 1"=40'
APPROVE:	NUMBER:
DATE: 09/24/2003	FILE: